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Book review

Nicholas Humphrey, Seeing Red: A Study in Consciousness, Harvard University Press, ISBN 0-674-02179-7, 2006, 151 pp.

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One of the many virtues of this fascinating book on consciousness is a (probably unintended) irony: the book's main thesis—that phenomenal consciousness consists in a subject's activity, not passive receptivity—feels least plausible in the case of the title example: Seeing Red. If the example had been Tasting Lemon, the thesis would seem less radical. The reason is that when tasting lemon, or hearing a soprano aria, or touching silk fabric, our own active bodily contribution to the experience is phenomenally much more salient. In all these cases my attention is drawn to the effect of the stimulus on my body and to my very immediate physiological response: a heightened awareness of certain tongue regions; covert tightening of vocal muscles in synchrony with the pitch of the singer; the response of my fingertips to the surface of the silk. But in the case of seeing red, I normally feel no bodily contribution: a patch of red seems entirely outside of me, and the sight of it to be something that happens to me. In Humphrey's 2004 Harvard University lectures (on which this book is based), he put up a large red screen before the audience, and asked them to attend to the red experience rather than to the screen itself. When I try to do that, my eyes feel detached from the redness itself, and as passive receivers. I'm not aware of *doing anything* to have the red experience. It's true that colors might produce different felt emotions, and brightness might hurt my eyes. But in themselves different colors do not make my eyes feel different when I see them. Humphrey recognizes this objection in Chapter 3, and his response will be examined then. For now, we may agree that colors, red in particular, are among the most common examples of qualia (along with pain and taste, which are both felt as bodily), and that without color experience, the "hard problem" of consciousness would seem much tamer.

Using colors as primary examples of qualia is useful because it forces a direct confrontation with the hardness of the problem. The difference between color and other qualia is important here because Humphrey's theory comes closer to explaining that difference than any other I know, even though superficially his choice of example seems at odds with his thesis. His book is persuasive that his theory applies even to color experience; I would like to show that color experience supports it even more strongly than experience in other modalities.

There is a second problem that remains, however. If we confine ourselves to qualia whose bodily effects we can sense, we still seem left with a gap. Humphrey argues that traces of ancient bodily responses to sensory input are still active in tiny "as-if body loops" that we now sense as qualia.

> For the mind side of the equation, our earlier analysis suggested that the experience of creating a sensation has many of the characteristics of creating a bodily expression. Now, for the brain side, we have constructed a history which suggests that sensations are the descendants of a kind of activity which once upon a time actually was a kind of bodily expression. (p. 98)

This part of his theory is ingenious and seems right as far as it goes. He shows how the subjective feeling of agency arises from this equation of brain loops with traces of bodily action. But subjective agency and qualia are different

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issues. For a complete explanation of qualitative experience, Humphrey needs to show that the qualitative *differences* among sensory experiences—between red and green colors, lemon and strawberry flavors, are commensurate with the *differences* among bodily responses. No matter how schematic or how condensed these traces may be, it still seems that they could be distinguished in objective terms, by reference to the body parts and movements they represent. But qualitative sensations, color in particular, do *not* seem distinguishable in that way. I cannot indicate the difference between red and green by calling attention to any bodily events.

Humphrey achieves most of his goals in this book, as I will argue. I will also argue that he sets up a structure that might be stretched to account for the problem of the *difference between differences* mentioned above, but that the stretch takes us a bit beyond the boundaries of Humphrey's theory.

After a brief summary of Humphrey's theory, I will discuss each chapter more thoroughly. Overall I will focus on two parts of the theory. First: the idea that overt bodily responses to sensory stimuli may have evolved into covert "as if" body loops, which are experienced as sensory qualia. Second: the idea that temporal thickness, or the "extended present," is the key mechanism behind conscious experience. The first addresses the content of consciousness, the second the vehicle. These two aspects of the theory are somewhat independent. Temporal thickness is a major component of Husserl's account of time consciousness, without any of the physiological hypotheses; conversely, Damasio's well-known account of "as if" body loops[1] says nothing about the extended present (though his account is compatible with Humphrey's in many ways).

The gist of the theory is as follows. As others have also maintained,[2] all sensory experience is an activity of the subject, not the passive receipt of input. The performing of this activity *is* the semantic grounding of the concept of "Self." Humphrey suggests that our distant ancestors would have reacted to stimuli with overt physical movements, such as wriggling when in contact with salt. At this stage, we cannot speak of qualia. Next, the organism learns to monitor its own responses, forming an inner "representation" of what its body is doing and thus begins "feeling sensation." Humphrey maintains that sensation and perception are quite different; sensation is characterized as follows:

> [H]aving a red sensation has something of the character of a *bodily action*, perhaps an *expression*. At any rate, it is an active first-person response to being stimulated with a red light. And, to bring this out, let's give a special name to what S is doing here: *redding*. (p. 15)

Humphrey insists that perception is distinct from sensation and arrived later in evolution. Here, he argues, new channels provide a new kind of analysis of worldly input, providing "a more neutral, body-independent representation of the outside world" (p. 92). The animal no longer can feel alone in the universe. Still, for its self-interest it needs the bodily information provided by the old sensory channels in order to predict the effects of continued (and, in more evolved animals, imagined) contact with various objects, so it continues to issue "as-if" commands to the body to produce the closed-circuit response/sensations that we now experience privately as qualia. Thus even though sensation is now completely private, or "subjective," it continues to occur in synchrony with the overt responses to third-person information—perception—about the objective world. The synchrony leads S to the belief that the subjective qualia are emanating directly from contact with the external objects as they are now represented.

The rich fullness of conscious experience is explained in terms of "temporal thickness," or the "extended present." Subjects are always sensing and perceiving in the present: "Now." But in objective terms the physical present exists for no more than an imperceptible instant, disappearing at once into the (no longer existing) Past to be replaced by the next Now, which had been the (not yet existing) Future. This sort of Now could not possibly be experienced by a subject. A solution has been proposed by many, including Husserl, of whom Humphrey makes respectful use. Experienced time is not instantaneous but stretched out, with "room for us to move around." Our Now includes our immediate past and anticipated future (Husserl's retention and protention), which appear to blend together into a homogeneous, extended period of present "temporal thickness" and slide smoothly and continuously into new presents, with new retentions and protentions.

Humphrey quotes this reviewer[3] who has argued that temporal thickness is conceptually incoherent: past and future cannot be present along with Now, according to our objective understanding of time; therefore we have no coherent

[1] [2].
[2] [4,8,10].
[3] [11].

way to describe or even think conceptually about what conscious experience "is like." The only things that are "like" anything are the objects of experience, and experience itself is not one of those objects. He accepts this claim and calls it "part of the answer but also part of the problem." I would put things the other way: the temporal illusion is the main part of the problem, but it can also help provide the answer. Understanding exactly how it is that we cannot do something can be as informative about that activity as being able to do it. The last section of this review will attempt to show why this is so.

Humphrey suggests that consciousness is mysterious and ineffable because it evolved to be that way in order to make our Selves (which are the primary content of consciousness) uniquely valuable and worth preserving. But while consciousness may indeed perform that function, here may be a case of Gould's biological "spandrels"[4] (incidental structures that come about as by-products of functional ones): consciousness is necessarily unanalyzable within experience, given the nature of sensory input and time experience, and the mystery is an evolutionary by-product of which animals like us can take creative advantage. An alternative explanatory hypothesis will be proposed at the end of this review.

Phenomenology of sensory experience

After an introductory first chapter, Chapter 2 begins the main argument with some phenomenology: what is it like for each one of us—each S—to see the red of the screen? Humphrey starts with a "subjective fact": S is creating visual sensations, and these creatings/sensations "are him, they constitute the very essence of his subjectivity" (p. 14). Humphrey highlights a point of fundamental importance here: experiencing sensations is experiencing oneself as a subject. That is all there is to us *as subjects*: the activity of creating experience. We are not the *observers* of the activity, we are the agents, and our agency is constituted by the activity itself; it is not a separate entity.

It is not clear whether Humphrey is describing how it *seems for S*—to be the creator of his own experiences—or how, in theory, *it in fact is* when the process is described, accurately as it seems to me, in objective terms. That S's experience is "his seeing red" is a "subjective fact" (p. 12–13). If that means that it is a fact *for* S, then that he is performing the act Humphrey calls "redding" must be how it seems to S. Humphrey acknowledges that this fact is somewhat opaque to S ("... just what he is doing will be more than he can fully say ... and extends deeper than he can put his mind to" (p. 16)). But still, "This sensation is clearly something that *he* creates" (p. 14).

How clear is this to S? It depends on who S is. I won't try to speak for a monkey, but S can be me, and I must say that in my normal state this is not (subjectively) clear at all. Not only am I in most cases "likely to give the [objective] fact of the screen priority," but it is a rare circumstance in which I would not *feel*, even when introspecting, that the red screen is acting upon me in producing the red sensation, and that I am the passive recipient of sensational "facts" *about the screen.* To be sure, for many "embodiment" philosophers it has become untenable to maintain that we are in fact passive recipients of unedited sensory input, but this is the way it normally *feels to me as an S.* While I fully believe that my phenomenal consciousness of red is a creative activity, I cannot experience it that way, any more than I can experience the pain in my toe as a state of my brain [9]. This point will be explored in the discussion of Chapter 3. It can be difficult to make a naive listener, such as a college student in introductory philosophy, believe that color is not entirely in the object as one of its primary qualities. Humphrey is here, I believe, taking advantage of 15 years of philosophical interest in embodiment, which has produced many persuasive accounts of the primacy of physical agency in human experience, but which may not have yet made its way into our naive intuitions. On the other hand, it does feel correct to say that

> it is strikingly obvious to the subject that the sensation, the redding, has a quality and a valency—subjective psychical properties ... S will feel that the sensation matters to him; he will mind about it" (p. 19).

But the question remains: does S naturally feel that it is the *sensation* itself that matters, or the "objective" color *of the screen*?

In whatever terms S thinks of it, however, it also seems right to say that "it is our experience of the inner world that confirms the existence of the person. ... S may well feel that the sensation "makes him." But he does not feel

[4] [6].

alone in his universe. Humphrey ends this chapter with a discussion of S's awareness of other people as having the same sort of experience he is. He is not the only S. It is obvious to this S, Humphrey argues, that there might be some differences between what it is like for him and for the other S, but it is not *obvious* to S that the other might be a zombie; there is an automatic assumption that social interaction is between two S's, not between an S and completely unknown quantity. How is S justified in making this assumption? Clearly, not logically, but (at least) emotionally: "The last thing S wants to believe is that he is the only Self there is" (p. 34).

In Chapter 3, as noted earlier, Humphrey argues for a strong distinction between sensation and perception. Sensation is not directly required for perception, but it *is* what makes us self-aware. The first-person character of sensation is exemplified in the clinical phenomenon of blindsight, in which there is perception but no sensation and the subject "does not care" about the perception as he would about sensation. He gives an example of a woman who experienced sight for the first time as an adult. She had never learned to use visual sensation to help define her Self, and so even when the disorder was corrected, "she did not experience [visual sensation] as a significant extension of her Self" (p. 70). It might have helped here if Humphrey had provided examples of sensation without perception, but the reader can think them up.

In this chapter Humphrey confronts the objection raised earlier, that we feel no specific *eye* sensations when seeing different colors; he cites other contemporary philosophers who make this claim. The objection seems to weaken his argument that bodily involvement makes sensation significant for our sense of self. He acknowledges the difficulty of answering the objection, and does so with a proposal he seems himself to find inadequate: we associate sensations with perceived objects because of the normally high correlation between having a subjective sensation and perceiving an external object. The correlation is not rough; it extends to minute details. Small perceived alterations in the object are correlated with simultaneous alterations in the sensation.

Correlation arguments are not as strong as one would like. As Kant said of Hume, observation of correlation alone could not yield the feeling of necessity that every event has a cause; and in this case it remains unclear how mere awareness of such a correlation can generate the conceptual distinction between subjectivity and objectivity, especially given the position that perception without sensation (e.g. Blindsight) is unconscious. I believe that Humphrey can make a more convincing response if my claims about the difference between color experience and that of other modalities are accepted. All the objectors cited by Humphrey talk only about color experience, and what they say seems to be true. But it does not necessarily hold for taste, sound, and other secondary properties. Seen color is unique in being completely unaccompanied by bodily sensations corresponding to color differences in themselves. (Emotional associations and preferences are a different matter—they are not felt as the unmediated effects of *color* on the body surface or behavior.)

Why should there be this difference between color experiences and the other types? One hypothesis is that Humphrey is quite right about the other types, but that color, as a visual property, is experienced as fitting and covarying with the perceived parameters of the object in a way stronger than mere correlation. Color sensation in that case would not be explained as the result of internalized responsive movements, and thus need not be always accompanied by bodily sensations.

If the above is true, then the objection worrying Humphrey in this chapter might be answered. But a harder one arises. If color sensation is not identical with internalized body movements, what is it? This question can be put off until the discussion of Humphrey's other main claim: that the nature of time experience—the "thickness" of the conscious present—explains the real mystery of consciousness, "the factor X" as Dennett calls it (p. 39). Most importantly, this explanation is necessary not just for color but all the sensory modalities. It is no more clear how internalized body movements could become *qualitative* content than it is how rod and cone processes, or their results, could be consciously experienced. It is also unclear how internalized body movements, however condensed, could be experienced as visual qualia. As noted earlier, the differences among various bodily responses to sensory input do not seem sufficient to account for qualitative differences. I might respond to red with one set of movements and to green with a different set. These differences in bodily response are reducible to the same language; they are completely describable in terms of different parts of the body, which can be understood objectively. The qualitative difference between red and green cannot be captured in such objective terms.

Chapter 4 makes a bold and original move. Humphrey puts the problem in terms of an equation, with phenomenal experience on one side and neuronal processes on the other. These two sides do not have the same conceptual dimensions, so how can they be understood as referring to the same kind of thing? This problem is the famous "explanatory gap"; how can it be closed? What is needed is something bodily on both sides of the equation, and the one

thing available is action—goal-directed, not reflexive. If we think about the actions of S, particularly those used to express how S feels about something, we see that bodily action has "five defining characteristics of the experience of sensation": ownership, bodily location, presentness, qualitative modality, and phenomenal immediacy (pp. 82–83). My own actions have these characteristics, and actions are clearly bodily. Therefore, if sensations like seeing red can be identified with bodily actions on the experience side of the equation, then the two sides would have the same conceptual dimensions.

The similarity between action and subjective experience in general, is striking and convincing. It must be a significant part of the solution. The fundamental difficulty regarding qualia, however, remains. Even if different colors can be firmly associated with different types of bodily actions, the differences in the two cases are incommensurable. The tartness of lemon juice is constantly associated with, and may be expressed by, a response of my tongue, but the *flavor* of lemon is still unaccounted for. For now, although far from the complete answer, Humphrey's observation is clearly a major step. Intentional actions (as distinct from automatic movements) are both bodily and uniquely tied to the subject, like no other physical events. The value of this analogy can be seen clearly in this simple case: just as no one can directly experience the subjective experiences of another, no one can perform another's actions. This statement can be misunderstood: of course I could do the same thing you are doing, by copying you detail for detail. We would be performing exactly the same type of activity. But there would still be two action-tokens: the one with you as the agent, and the one with me as the agent. The occurrence of any specific instance of an intentional action—this action—*essentially involves* the agent as the performer of the action. If seeing red is an activity you are performing, then I cannot do it for you without making it a different activity: my own. This situation is a central part of the concept of subjectivity as well. That an experience is subjective does not mean simply that I cannot *observe* the experience that you are having, as though you were watching a private television that I have no access to; it means that I cannot do YOUR watching, I can only do MY watching. This seems to be a conceptual truth (although who knows what clever neuroscientific theories might one day force alterations in these conceptual structures).

This move strengthens and clarifies the idea that in sensation we find our Selves. No inferential reasoning is needed: if my (nonvisual) sensation is an *intentional* activity, then I am the agent. A sort of "awareness" of this fact can be part of preconceptual experience; as an infant I may not have a self-concept, but I am experiencing myself nonetheless, in an unmistakable way: I am *constituted* by my agency. My agency will be the experiential (as well as the conceptual) ground of the concept of Self.

Note that we are still exempting "redding" from this primal agency experience. I do not experience my agency at all in the case of the red sensation; it can be a bodily *process* without being intentional *action*. Not every sensation or type of sensation would require its own separate bodily expression. In the case of color, the sensation can ride on the bodily experience of seeing and tracking objects that are perceived. It is the objects that I experience as central to my well-being; colors serve to distinguish one from another. It is true that bodily responses to different colors differ: a red room makes its occupants anxious, while a blue one calms them down. But that, as we've noted, is a different matter.

An objection to the idea that *action* can bridge the subjective/objective gap might be that it begs the question in the following way. Actions are intentional; agents are subjects: they experience their voluntary intentional activity along with feedback from their bodies carrying out their intentions. If so, we now have unreduced subjectivity on both sides of the equation. But we might respond by noting that on the view promoted here, experiencing oneself as an agent can be preconceptual. Being an agent does not presuppose an experience *of one's Self as an agent*, which would require the concepts of Self and agency. Being an agent presupposes only being able to choose an action. It is an ability presumably available to many animals as well as human babies. It is the sense of volitional agency that makes goal-directed action (as distinct from movement) possible. Without that sense, an organism would not *attempt* to do anything. Recall the discussion of people with blindsight: they can actually perceive shapes and movements of objects, but they do not experience themselves as agents in this perceiving, and therefore do not spontaneously choose to make use of the ability.

Preconceptual experience of agency is not like reflecting on the experience of seeing red. In the latter sort of introspection, concepts of self and external objects are necessary. The acceptance of itself as an agent is already implicit in every goal-directed act of the organism. In primitive cases, it is not appropriate to speak of a subject making an association between its "Self" and the actions it performs: the performance of the action is itself the experience of Self, whether or not the organism can articulate this identity or consciously reflect on it. As claimed earlier, this primal identity serves as the experiential ground of the later concept of the Self as agent. The objection that using "action" to balance the subjective/objective gap is question-begging would hold only if the *concept* of agency were essential

to intentional, or goal-directed, action, but as I have argued above, it is not. Goal-directed, as distinct from reflexive, action can be a sufficiently primitive phenomenon to serve to balance the objective side of the equation.

There is a lingering worry about the concept of "action" in the theory. Humphrey at times seems to conflate intentional with automatic bodily events. The suggestion above, that intentional action is the only kind necessary for Humphrey's general theory about consciousness, might still not work completely. In the increasingly popular embodiment movement, it is crucial to distinguish between intentional goal-directed action and nonintentional (or subpersonal) bodily processes occurring in response to stimuli. Only the former can serve as the actions needed by embodiment theorists.

In Chapter 5 Humphrey makes a nice connection between sensations-as-actions and the recent discovery of mirror neurons—neurons theorized to be activated by *both* one's own actions and the perceived actions of another. When one performs an action, the subjective sensation of it is mediated by these neurons, and when one sees another performing a similar action, the same neurons form an objective representation of it. Mirror neurons are an extremely exciting discovery because they appear to accomplish what had seemed impossible: to establish a direct link between the subjective and the objective—between sensations and objects. This link supports the use of actions on the subjective side of the subjective/objective equation: if goal-directed (or intentional) actions and subjective experiences are represented by an identical set of neurons, then the explanatory gap might already be closed![5] But that closure does not address the kernel of the hard problem: how could these neurons (or anything else) produce the richness of phenomenal consciousness? For that problem we still need Humphrey's time hypothesis.

Notice that the difference between color experience and that of other modalities does not yield to the introduction of mirror neurons; it remains as stubborn as ever. If we can empathize with other's experiences by observing their overt actions, then however much we covertly experience those actions subjectively, we will not experience their "redding," since redding is not and never was an overt or intentional activity, as has been repeatedly argued here. But as has also been argued, color experience comes along for the ride once we fully explain the "X factor," which is the goal of Chapter 6. Thus we now turn to the other major component of Humphrey's theory: temporal thickness.

The extended present

As noted earlier, qualia can be experiences because the subjective present in which they occur is not instantaneous, but extended or "thick." Humphrey's analogy is to a spaceship; I find that difficult, and instead picture a touring railroad train, with glass windows framing a changing but well-defined landscape. In this touring train you can compare different features of the scenery, and get an idea of the substantive whole, all at once, where you're been and where you're going, and how the parts are related to each other, without having to piece it together inferentially from memory (if this were even possible). In this analogy the changing spatial positions of objects seen from the train correspond to short-term events that we seem to experience as taking place entirely in the present, during which we are aware of both their beginnings and their ends. A temporal rather than a visual/spatial analogy would be preferable, but the poverty of our time-language makes that difficult.

Only a few other philosophers have explored the idea of the extended present. The earliest references start in the 19th century.[6] Husserl 's contribution has been noted. In addition, see [5,7].

The notion of an extended, or "thick," instant of time sounds like a contradiction. Time is a single dimension among three spatial ones. A line extending into one spatial dimension cannot be "thick" without, it would seem, encroaching on a second dimension. We think of time analogously: there is "room" for only one moment at "a time"; time seems unidimensional in our ordinary experience and associated conceptual system, whatever alternative possibilities are hypothesized by cosmologists and particle physicists. Time's flow seems continuous with no breaks or sudden stops.

But as Humphrey points out, our experience of the present time is, paradoxically, thick, because we feel as if *right "now" we "have time"* to direct and redirect our attention to different objects, watch brief events begin and end, without these objects and events disappearing into the past where, according to our physical concepts, it is out of sight, no longer happening. Of course we can remember the immediate past very vividly and compare the memory

[5] Borg [1] argues that mirror neurons do not provide the specificity required for knowing fully another's intentions; e.g. one perceives that another intends to pick up a cup, but why, or then what? But if any degree of intentionality is captured by mirror neurons, then the gap is closed sufficiently for Humphrey's purposes.

[6] mind.ucsd.edu/papers/bhtc/Andersen&Grush.pdf.

with the current moment; but still we clearly feel the current moment to be Now, and the *remembered* moment to be Not Now. What we are calling Now does not include the Not Now, but it does include the time it takes for a brief event to unfold before our eyes (or a short melody to be heard in its entirety by our ears), and that time is longer than an instant. And not only do we experience events unfold in time, we also experience our selves to be a process unfolding along with external events we witness. The conscious subject is experienced as inseparable from the present moment: I am an actively perceiving body, not something outside the flow of events but part of it.

The above describes a paradox. Without retention and protention, there could be no conscious experience. Retention and protention insert past and future into the present. That should mean that each present moment "lasts" longer than an instant. But if each moment did last longer than an instant, the constant flow of experienced time would be discontinuous, interrupted. Because we do not experience interruptions in the flow of events in time, we seem to have experiences that cannot be coherently described. At the same time, however, we have the illusion that our experience makes perfect sense.[7]

How can this subjective fact about our experience be explained by events in the physical brain? Humphrey appeals to recently discovered "re-entrant circuits" [3], in which "neural activity loops back on itself" fast enough for the original responses to interact with incoming stimuli. The process has become fast enough, because of the internalization in evolution of responses to stimuli and consequent shortening of the neural feedback loop, that "sensory responses could well react with the very input to which they are a response ..." (p. 122). Thus a superposition of already-processed with new input takes place, creating the experience of the expansion of the present moment.

How would this superposition and sense of expansion explain the X factor? All we need, Humphrey argues, is one more element: "a very fine tuning—a precise matching of output with input, so as to provide exactly the right degree of reinforcement of the signal in the loop" (p. 123). In speaking of such a tuning mechanism he refers to a quantitative superposition of distinct temporal moments of sensory response. The "matching of output with input" must refer to neural activity. We can understand that the brain might well have a mechanism for this activity. But what is still unclear is how the mechanism that operates on quantitatively described events in the sensory systems could also explain the qualitative experience. Once again: the sensory events can be roughly analyzed into components of neural activity—one component stored and recycled in reentrant loops or working memory, the other responding to new input. Qualitative experiences cannot be so analyzed. They have no components that we can experience as such. It might be the case that a processed quale can be somehow "matched" to a quale currently in process, but how this could happen in *the neurons of the brain* is as much of a mystery as it ever was.

Humphrey partially confronts this objection, but his meaning is not entirely transparent. He writes:

> ...we have the possibility of something wonderfully well-tuned "emerging." But do we really want to rely on emergence to explain this?
>
> [Previously] I implied that once the sensory response circuits have evolved to the point where they could in principle support sustained feedback, the rest will follow simply as a matter of course. But the truth is, it is most unlikely to happen automatically. In fact, it will not happen unless it is *designed* to happen, and this has to mean, presumably, *designed by natural selection*.
>
> But why? Whatever could be the payoff of feedback ...that brings about a thickening of consciousness? ...I think the payoff is that it gives the subject quite a new sense of Self. It lifts the subject out of zombidom." (pp. 123–124)

[7] Velleman [12] argues that illusions of this type are necessary grounding for our concept of self. He describes the illusions in terms of our apparent experience of a self that is at each moment wholly unified, and also in terms of our paradoxical experience of time both passing and standing still. Here is his account of the former illusion of the self:

> The selves superimposed in this appearance are two momentary subjects: I in my present capacity as the subject of memory, existing just in the moment of remembering, and the "I" of the remembered experience, who existed just in the moment of the experience. In either case, I am conceived as wholly present at a single point in time, either as me-here-and-now, entertaining the memory, or as "me"-there-and-then, having the experience. Superimposing one of these momentary subjects on the other yields the illusion that they are numerically identical—that the subject whose existence was complete in the moment of the experience remembered was one and the same as the subject whose existence is complete in the moment of remembering. This appearance is already incoherent if one and the same thing cannot have its existence confined to each of two differing moments. The incoherence is compounded by the thought that this momentary subject has persisted through the interval between the original experience and the memory, existing in its entirety at each intervening moment. (p. 9)

This response is a teleological explanation, but we need a mechanistic one. Of course natural selection is a mechanism, but on a different level from those in the brain. We still do not know *how* the step from quantitative to qualitative events can take place; a theory of *why* it took place cannot help us there. Humphrey needs a mechanistic explanation because he wants to go beyond a reliance on mere "emergence," realizing that to say simply that a property has emerged is to say nothing else about it at all. His evolutionary explanation is a good account of the value of conscious experience, but this value could be appreciated only *after* its appearance, whether by emergence or in some other way.

There might be another way that arises naturally out of thick time itself; Humphrey himself refers to it in speaking of "the substantiality that goes with *existing in thick time*" (p. 125). I think we could use more speculation about the nature of that thick time, and about the substantiality. Physical, objective time is not thick; it has only one dimension. To speak of existing in thick time is to speak of an expansion of familiar unidirectional time, of the creation of a private experiential zone. Of course the existence that Humphrey refers to is subjective, not objective existence, but that is exactly why thick time experience is inaccessible to anyone but its subject. It is not just because it is "subjective" in the sense of "mental"; it is because it takes place in, we might say, a subjective temporal zone (in addition to the objectively known spatial and temporal ones). If the theory of thick time is right, then each of us exists in our own private temporal zone, one that simply *does not exist* from an objective point of view.

One way to think about thick time is by an analogy to space–time dimensionality. Imagine consciousness of the present as occupying a fifth dimension in addition to the four-dimensional space–time continuum. It does not seem wildly implausible that along with the known dimensions of our physical world there might be other dimensions to which we have no objective access. The only difficulty in supposing this, that I can see, is that while the other spatiotemporal dimensions are physically measurable this second temporal one is not obviously so. Pretend that there is somehow room in the universe for time to expand sideways, at right angles to its forward direction. If we imagine the experiencing agent able through neural connections to retain or superpose its representing of past, present and future, so that they are all present together, then we are pretending or imagining that the time dimension can have width in addition to length. And there is no mystery as to why *you* cannot experience *my* thick time. You cannot co-occupy the space my body is occupying, either. My thick time exists only in my actions of creating it, which are my intentional efforts to choose and plan my own goal-directed action.

How would this speculative idea explain qualia? In an unsatisfying but perhaps necessary way: the red we consciously experience is the effect of red-responding events (*not* intentional actions) in the rods and cones, *when they are stretched out in thick time.* In thick time, they take on substance. There is nothing corresponding to temporally stretched-out response events in the objective world, so there is no way to measure or analyze them. Accordingly, there is no way we can understand in objective terms how it is that stretched-out red and stretched-out lemon are distinct phenomenal qualities. But there is also no reason at all for us to doubt that they could be, since their existence contradicts nothing that is known about the objective world. They are not "mysterious" in the sense that is normally used for "mental" events. Their brain mechanisms are clear. They are not other-worldly. They can be seen, in Humphrey's terms, as "deliberate trickery" on the part of the brain, if by that we understand that qualia have an illusory nature: they seem to us, when thinking naively, to have the same ontological status as measurable objective events. That is why we are so puzzled by them. If something like this were right then the X Factor itself has not been described in ordinary objective terms, but the *kind of thing it is* would be clearer. It is what happens when sensory system responses are fully expressed in an enriched and complex temporal span.

Humphrey asks why we should have evolved the ability to experience thick time. Of course it makes us valuable to ourselves, but primarily it is because we are agents. Agency requires choice; choice requires comparison of options. If the comparison is among various states within the organism itself, states accessible to the senses, then we would have to be able to lay them out side by side, so to speak, so as to compare them *in our subjectively present time.* If that were to be true, then conscious beings would be less constrained by the known spatiotemporal dimensions than has been assumed. The sensory looping that creates thick time in an organism allows that organism to experience a second temporal dimension, one in which our familiar qualia reside.

Would this supposed fifth dimension be "real?" What is its ontological status with respect to the known spatiotemporal dimensions, which we now understand to be equivalent to curvature of space–time? As conscious subjects do we each, privately, create our own version of a fifth dimension, or was it there all along? I will not attempt answers to such questions. The supposition of a fifth dimension is intended as an analogy only, not a hypothesis. Too many details of possible mechanisms are missing.

Conclusion

At the beginning of this review I said that the nonbodily nature of color experience, and to a lesser extent of other modes of qualia, might be helpful in finding an explanation. Humphrey's proposal of temporal thickness could be just what is needed: a radically new perspective that is, at least possibly, compatible with physical science. "Seeing Red" is a work of relentless honesty about what is clear and what is not clear, written in a lighthearted tone, and rich with vivid explanations, and helpful, entertaining illustrations. It is a great pleasure to read. More importantly, it is an invaluable contribution to the mind-body debate for three main reasons. First, it addresses the question of what constitutes Selfhood in a way that is straightforward, parsimonious, and intuitively plausible. There is no multiplying of perspectives on our experiencing and our experiences, there is only the experiencing itself. Second, in viewing Selfhood in terms of Agency, and noting the analogies between experience and the bodily responses to sensation Humphrey calls "expression" (pp. 81f), he makes an important contribution to the "embodiment" movement. Third, in confronting the qualia problem, Humphrey employs the concept of the extended present more centrally and more lucidly than we have yet seen in the contemporary consciousness debate, exposing an intriguing new perspective on consciousness.

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